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REPORT TO  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

with respect to Grant NsG-342,  
covering the period September 15, 1964  
to March 15, 1965.

**UNPUBLISHED PRELIMINARY DATA**

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## INTRODUCTION

This third Progress Report supplements the report on NASA Research Grant NsG-342, submitted with Provost Pake's letter of December 8, 1964. It covers the period September 15, 1964-March 15, 1965.

With the exception of several new items, the studies described here correspond to those covered in the preceding report. The emphasis is on new developments. The earlier report should be referred to for general descriptions of ongoing projects, as well as for financial and related supporting data.

## REGIONAL EXPENDITURE IMPACT STUDIES

Mr. Se-Hark Park has completed his study, An Analysis of Regression Estimators for Urban Employment Multipliers and their Application to the Employment Impact of the Aerospace Industry in the St. Louis SMSA. This study is currently being reproduced and will be distributed shortly.

Professor Edwin Terry's study, Linear Estimators of the Export Employment Multiplier, was published as departmental Working Paper 6415, November 3, 1964.

Professor Murray L. Weidenbaum, with the assistance of Professor Terry, continued work on developing a comprehensive body of data on the regional and industrial distribution of defense and space manufacturing employment. At the March 11, 1965 session of the Washington University Economic Department's Workshop on the Economic Impacts of the Space Program, Professor Terry described the specific statistical techniques to be employed in deriving the new data on defense and space employment, cross-classified by industry and region. He also described some of the

approaches to be used in analyzing the data. The latter included a variant of the Dunn-Ashby approach whereby a state's share of total defense/space employment is classified according to the influence of the industry mix, its competitive status, and the overall importance of defense and space employment to the national economy.

Mr. Michel Andrieu and Mr. Robert Bohm, under the supervision of Professors Werner Hochwald and Murray Weidenbaum, began an analysis of the regional and industrial distribution of the subcontracts awarded by the McDonnell Aircraft Company under the Gemini program. The resultant data are intended to provide inputs to the preparation of inter-regional input-output models.

#### NATIONAL ECONOMIC IMPACT STUDIES

Professor Edward Greenberg is undertaking an analysis of the employment impacts of defense obligations and expenditures. The research being carried on consists of three parts:

- 1) A description of the defense procurement process and its implications for econometric models designed to analyze the time path of the economy in response to changes in variables controlled by the Federal Government.
- 2) A review of existing models to determine if they accurately describe the process as indicated in the previous step.
- 3) Empirical work designed to illustrate the importance of variables affecting employment which have been neglected in previous empirical work.

An early draft of the study was presented to a faculty economics department seminar at Iowa State University on February 15, 1965. Revisions are being made to take account of comments received and additional statistical data being developed.

Professor Murray L. Weidenbaum is beginning an analysis of the overall impact of defense and space expenditures on the national economy. This is intended to be in the nature of a survey article, reporting the "state of the art." Publication is anticipated in a volume on defense economics to be published by Prentice-Hall later this year or in early 1966.

#### STUDIES OF THE ECONOMICS OF SCIENTIFIC RESEARCH AND MANPOWER

In his recent research on the engineering and scientific labor market, Professor Hugh Folk has concentrated on the following subjects:

- 1) The relationship of engineering job vacancies and unemployment in various labor market areas and specialties. A working paper reporting the findings is close to completion.
- 2) A detailed examination of scientists and engineers salary structures in the aerospace industry, other private industries, NASA, and other government agencies. Necessary statistical computations have been completed.
- 3) Examination of the responses of the supply of new engineers to higher wages. This study is close to completion.

Professor Edward Kalachek has been exploring various aspects of labor market adjustments, including the effects on marginal labor force groups with limited skills. Results will be incorporated in a

paper to be presented on Expanding Employment and Labor Market Versatility, to be delivered at the Third Annual Conference on Unemployment at the University of California, Berkeley, in June, 1965. The proceedings of the conference are scheduled to be published shortly thereafter.

LEGAL AND ECONOMIC STUDIES OF "NEW TOWNS" AND LAND ASSEMBLY AND ACQUISITION IN METROPOLITAN AREAS.

Mr. John P. McFarland has completed his study, The Administration of the English New Towns Programs, which was distributed in Working Paper form in December, 1964. An article based on this study is scheduled for publication in the symposium on New Town development in the Spring, 1965 issue of the Washington University Law Quarterly.

Mr. Gary Sacks, under the supervision of Professor Daniel Mandelker, is undertaking research concerned with changes in the urban legal structure in areas of rapid growth induced by space-related and similar activities.

INDUSTRIAL IMPACT STUDIES

Mr. Edward Heiden has completed a draft of his study, An Economic Analysis of Commercial Satellite Systems. The draft is currently being reviewed by the supervising faculty within the Economics Department.

Professor Marshall Hall is continuing work on his study of the impact of defense and space programs on merger patterns. Currently, efforts are focused on developing data on mergers involving the major defense and space contractors.

Some preliminary results of the study of the impact of defense and space programs on the allocation of resources within companies was included in a paper presented by Professor Murray L. Weidenbaum in December, 1964. The paper, Product Management for Defense/Space Markets, is scheduled to be published in the Proceedings of the 1964 Annual Meeting of the American Marketing Association.

#### ADMINISTRATIVE MATTERS

The Economics Department at Washington University has established a Workshop on the Economic Impact of the Space Program. The purpose of this seminar is to provide an opportunity for faculty and graduate students participating in the NASA project to benefit from suggestions and criticisms offered by the group at various stages in the course of their research in progress, and final reports. The first session, held on March 11, was devoted to Professor Terry's presentation described earlier.

Several opportunities were utilized to disseminate some of the results of the research described previously to professional and academic groups. The project director addressed the Washington Statistical Society on Economic Dimensions of the Defense Cutback on December 16, 1964. He also presented a paper on Role of the Federal Government in Defense Cutback Adjustments to a conference held at the University of California at Los Angeles on November 14, 1964.

During the report period, NASA extended the Research Grant NsG-342 for an additional year, to June 30, 1967, [REDACTED]

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